Klamath Network Vegetation Protocol Development Meeting 2
December 13-14, Ashland, OR.

Notes

1. Review and confirm objectives.

Objectives :

- Detect temporal changes in composition, diversity, and structure of predominant terrestrial vegetation and select special interest vegetation (vascular plants) at multiple scales.
- Determine temporal changes in fuel (e.g., downed woody debris and duff).
- Where possible, document major forms of disturbance affecting plant communities.
- Make program adaptive, if possible.

Measurable Objectives (From Central AK)

Detect changes in the absolute and relative abundances of the different growth-form classes that form the vegetation cover of the park.

Detect change in the abundance and composition of the dominant species in the vegetation cover.

Detect change in the distribution and abundance of discrete vegetation types on the landscape of the parks.

2. Determine specific attributes of vegetation that need to be measured to accomplish objectives.

Considerations: What is needed to accomplish objectives? What objectives may be met with existing and past sampling (FIA, FMH)?

Possible attributes: 3 = h, 2= m, 1= low priority based on need, feasibility and time

Primary	**Derived**
-Understory species and ground cover (intercept?) -3	**-Species area relationship**
-Midstory species cover (intercept?, look at firemon -3 For definition)	**-WHR type and other wildlife attributes**
-Overstory cover (densitometer or photo?) -3	
-Additional species presence (for species area) -3	
-Density (live and dead tree species, size class) -3	
-Basal area, live/dead (which species, size classes) -3	

-fuel (woody debris by size and decay class) -3 -Fuel model
-plant vigor/health -look into checklist
-disturbance (note influential recent disturbances in plot? Checklist)-3
-tree age? FIA
-soil? Use maps
-permanent photo points -3
-location attributes (gps)-3
-tag trees?
-aspect -3
-slope -3
-plot map

Type of plot?

Circular for trees except for riparian or other strong local gradient effects?

Circular for efficiency? Variable radius in forests

3. Determine sampling of predominant vegetation vs. areas of special interest.

Special interest areas of limited extent: Which can be monitored by rs?

<u>Highest priority under I&M veg protocol</u>
-Riparian and other wetland (REDW, CRLA, LAVO, WHIS, ORCA) -3 High habitat value, need to define.
-Sensitive high elevation habitat (CRLA, LAVO, WHIS) -3 Rapid change due to climate?
-Edaphic or unusual environments (Serpentine, Pumice Desert, cliffs, Puccinellia meadow (need to define and test feasibility of dangerous areas) -3 unique, continue past sampling, relatively inexpensive

<u>Not as easily justifiable to include in veg protocol</u>

-Coastal vegetation (REDW will monitor) –SS
-Bald hills ((REDW will monitor) –SS
-Old growth (WHIS) -2 unusual for area, high habitat value (may need to prioritize at WHIS if not sampled by matrix approach).
-Mixed conifer (CRLA. WHIS, ORCA, LABE) -2 (may need to prioritize if not sampled by matrix approach, need to define for each park)

<u>Will be sampled under separate VS protocol</u>

-Cave entrance community (separate <u>vital sign</u>, ORCA, LABE) -3
-Lava trenches (LABE) -1

-Aspen (focal community vital sign LAVO, CRLA) -3
-Whitebark pine (focal community vital sign LAVO, CRLA) -3
-Chaparral (CRLA) -2 use remote sensing and sample under land cover VS
-Montane meadows (CRLA, ORCA) -2 Land cover VS, also will get sampled under wetland and high elevation vegetation sampling (use air photos?)

Areas to downweight

Remote?

Areas to exclude

Lava fields?
Talus (LAVO)
Rock outcrops
Coastal Bluffs

Considerations: Budget limitations, feasibility (e.g. accessibility, vegetation that is time consuming to sample, etc), safety, what vegetation is of greater interest for more intensive sampling.

4. Determine sampling frequency timing and intensity at a given sampling location.

Considerations: Rate of vegetation change, tradeoffs in sampling frequency and total number of plots sampled, feasibility, efficiency.
Check Dan Doak's Website for monitoring framework.

http://bio.research.ucsc.edu/people/doaklab/natconserv/summary.html

A Summary of the Tools: Data Analysis and Modeling Methods included in this site

Tools for the Design of Monitoring Programs:

Tool A. Testing and Planning for *Spatial Auto-Correlation:* Getting Past the Pseudo-Replication Mindset

A key stumbling block in the design and analysis of many monitoring and management programs is the bugbear of pseudo-replication – the shortage or lack of ideally replicated, independent treatment areas. An emphasis on this problem has led many conservation biologists to think that many if not most monitoring and management experiments simply cannot be evaluated statistically. However, this problem is more reasonably thought of in terms of spatial correlation, rather the extreme and less correct view of what makes a perfect, proper replicate. Two relatively simple tests for spatial autocorrelation patterns allow better planning of the data collection in conservation settings, and provides the backdrop needed for incorporation of spatial autocorrelation into actual analysis, the topic of Tool E.

Tool B. Assessing the Power of Different *Presence-Absence* Monitoring Methods

Simply noting the presence or absence of a species at each quadrat or sampling location would seem to give far too little data to be of much use for monitoring. However, the speed with which presence/absence data can be collected, combined with the rarity or difficulty of detection of many species, can make this a more powerful monitoring method than more complete censusing efforts in some cases. We rely here on the results of simulation models to estimate the statistical power of different monitoring methods in different settings.

Tool C: Selecting data to target for population-level monitoring

Given the plethora of possible data to collect on a species to monitor its viability and response to management and other environmental changes, it is frequently unclear what monitoring data to focus on. The most common kind of monitoring data collected is probably some type of abundance measurements for individual species, but there are many other possibilities. Thus, in deciding what data to take and use, one should think carefully about tradeoffs in the kind of information and kinds of analyses allowed by different alternatives. We briefly discuss these issues, and provide a tool to help make and justify the decision about which data to target for collection.

Tool D. Collecting *Multi-Species Data* to monitor community change

Increasingly, conservation management and monitoring are focused on whole communities, or certain indicators of community health or restoration status. In deciding what data to collect to assess community recovery or degradation, it can be key to think about the information obtained from each species or guild monitored. In particular, this tool lets you use preliminary data to understand how strongly correlated different species are with one another, and thus what additional data you obtain from sampling different combinations of species.

Tools for the Analysis of Monitoring Data:

Tool E. Incorporating *Spatial Auto-Correlation* into Simple Statistical Analyses

If there is substantial correlation in your data across space, there are some very simple ways to include this information into statistical tests for site or treatment effects.

Tool F. Testing for Declines using *Presence-Absence Data*

We provide a test for significant declines in populations across time, given presence-absence data at multiple sites.

Tool G. *Simple Population Viability Analysis* using Count Data

If count or other abundance data give estimates of absolute or relative numbers through time, you can use these data to estimate population growth and extinction risk. These analyses are easily update-able each year to provide ongoing assessment of what you can conclude about extinction risks and projected population growth for a population.

Tool H. Testing *Population Performance using Count Data*

Even if you have data on abundance of individuals that does not fit the assumptions needed to assess population growth or extinction risk (Tool G), there are still several quick and simple ways to powerfully ask about changes in population data that will give indications about changing population status.

Tool I. Assessing the *Effects of Management Actions or Environmental Impacts*

We often want to test for the effects of management changes, of one-time impacts, or of emerging threats, such as invasive species. If you have data for two or more censuses from before and after the onset of the impact or management change and have data for both the impacted and a control site, you can use this tool to perform the kind of impact analysis known as BACI (Before/After; Control/Impact).

Tool J. Using Regression and ANOVA Outputs to address *Management Decision-Making*: *Information-Theoretic (AIC) Interpretations of Data Analyses.*

Traditional significance values from parametric statistical tests do not directly jive with the need to make decisions about the continuation or modification of management in conservation settings. However, these results can be used within a different statistical framework to better inform management. We show how this is done for linear regressions and ANOVAs.

Tool K. Using *Multivariate Data* to Track and Test for Community Change

There are many ways to summarize and analyze multi-dimensional data, such as information on community structure through time. However, many of these methods are quite complex, both in execution and in interpretation. We show how to perform a simple analysis that directly asks if a community is changing over time.

Contact Information